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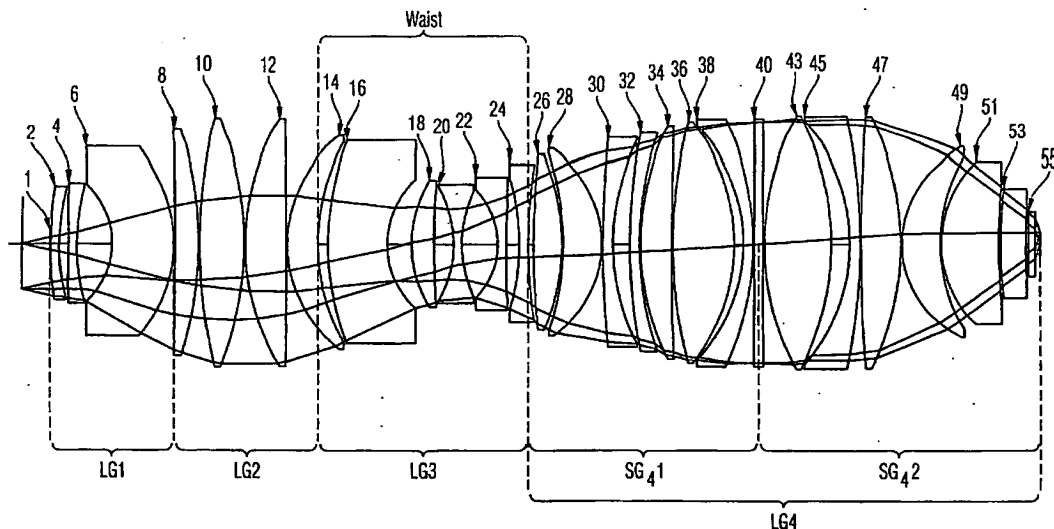
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(54) Title: **PROJECTION OPTICAL SYSTEM**



(57) Abstract: A projection optical system comprises a plurality of lenses disposed along an optical axis of the projection optical system; wherein the plurality of lenses is dividable into four non-overlapping groups of lenses of positive and negative refractive powers, wherein the following relation (1) is fulfilled: (1) wherein: y is half a diameter in mm of a maximum image field imaged by the projection optical system, NA is a maximum numerical aperture on a side of the second object, ϕ_i is a refractive power in mm^{-1} of the i^{th} lens, k is a total number of lenses of the projection optical system, and wherein V_1 is greater than 0.045.



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